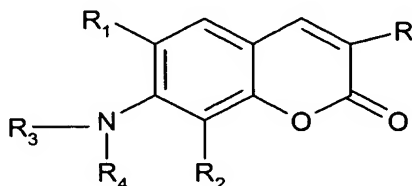


Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

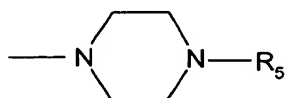
1. (Canceled)
2. (Canceled)
3. (Currently amended) A compound of the formula [[I]]



wherein in which

either R_1 and R_2 are both hydrogen; and either R_3 and R_4 , independently, are H, CH_3 , $^{11}CH_3$, $(CH_2)_nI$, $(CH_2)_n^{123}I$, $(CH_2)_nOH$, $(CH_2)_nF$ or $(CH_2)_n^{18}F$, n being 2, 3 or 4; or

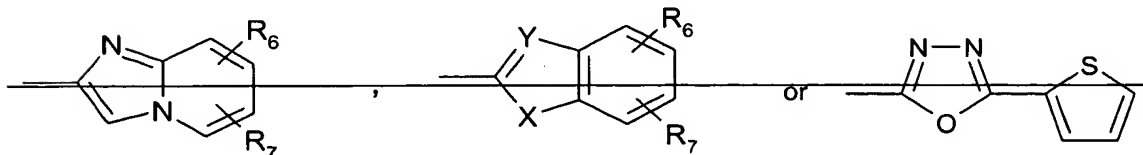
R_3 and R_4 , together with the nitrogen atom to which they are attached, form a group of the formula

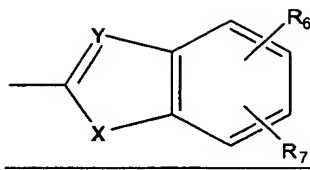


wherein in which R_5 is [[H]] hydrogen, $(CH_2)_nI$, $(CH_2)_n^{123}I$, $(CH_2)_nOH$, CH_3 , $^{11}CH_3$, $(CH_2)_nF$ or $(CH_2)_n^{18}F$, n being ~~as defined above~~, 2, 3, or 4;

~~or one of R_1 and R_2 is hydrogen and the other, together with R_3 , forms a $(CH_2)_m$ -bridge, m being 2 or 3, and R_4 is H, CH_3 , $(CH_2)_nI$, $(CH_2)_n^{123}I$, $(CH_2)_nOH$, $^{11}CH_3$, $(CH_2)_nF$ or $(CH_2)_n^{18}F$, and~~

R is a group of the formula





wherein in which X is ~~[[O,]] S or NR₈, R₈ being H, CH₃, ¹¹CH₃, (CH₂)_nI, (CH₂)_n¹²³I, (CH₂)_nOH, (CH₂)_nF or (CH₂)_n¹⁸F (n being as defined above), Y is CH or N₁ and R₆ and R₇, independently, are ~~[[H]]~~ hydrogen, NO₂, F, ¹⁸F, O(CH₂)_nF, O(CH₂)_n¹⁸F, Cl, CN, ¹¹CN, OCH₃, O¹¹CH₃, I, ¹²³I, O(CH₂)_nI or O(CH₂)_n¹²³I (n being as defined above), n being 2, 3, or 4;~~

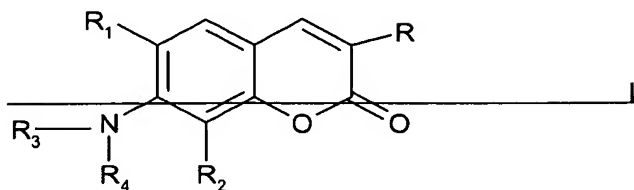
with the ~~expection~~ of

~~7-Dimethylamino-3-(1-methyl-1H-benzoimidazol-2-yl)-chromen-2-one~~
~~3-(1H-Benzoimidazol-2-yl)-7-dimethylamino-chromen-2-one~~
~~3-(6-Chloro-benzothiazol-2-yl)-7-dimethylamino-chromen-2-one~~
~~3-Benzothiazol-2-yl-7-dimethylamino-chromen-2-one~~
~~3-Benzooxazol-2-yl-7-dimethylamino-chromen-2-one~~
~~3-Benzooxazol-2-yl-7-methylamino-chromen-2-one~~
~~3-(5-Chloro-benzooxazol-2-yl)-7-dimethylamino-chromen-2-one~~
~~7-Amino-3-(1H-benzoimidazol-2-yl)-chromen-2-one~~
~~3-Benzothiazol-2-yl-7-dimethylamino-6-methyl-chromen-2-one~~
~~7-Dimethylamino-3-(1-ethyl-1H-benzoimidazol-2-yl)-chromen-2-one~~
~~7-Dimethylamino-3-(6-methoxy-benzothiazol-2-yl)-chromen-2-one~~

in free base form or in acid addition salt form.

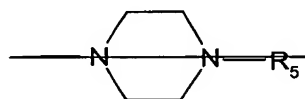
4. (Currently amended) The compound according to claim 3 of the formula I, which is 3-benzothiazol-2-yl-7-[4-(2-fluoro-ethyl)-piperazin-1-yl]-chromen-2-one, in free base form or in acid addition salt form.
5. (Currently amended) A composition for labeling histopathological structures in vitro or in vivo, comprising a compound as defined in claim 3 of the formula I, in free base form

or in acid addition salt form.



wherein

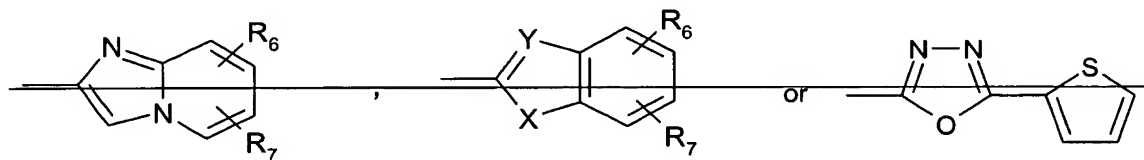
either R_1 and R_2 are both hydrogen and either R_3 and R_4 , independently, are H, CH_3 , $^{11}CH_3$, $(CH_2)_nI$, $(CH_2)_n^{123}I$, $(CH_2)_nOH$, $(CH_2)_nF$ or $(CH_2)_n^{18}F$, n being 2, 3 or 4, or R_3 and R_4 , together with the nitrogen atom to which they are attached, form a group of formula



wherein R_5 is H, $(CH_2)_nI$, $(CH_2)_n^{123}I$, $(CH_2)_nOH$, CH_3 , $^{11}CH_3$, $(CH_2)_nF$ or $(CH_2)_n^{18}F$, n being as defined above,

or one of R_1 and R_2 is hydrogen and the other, together with R_3 , forms a $(CH_2)_m$ -bridge, m being 2 or 3, and R_4 is H, CH_3 , $(CH_2)_nI$, $(CH_2)_n^{123}I$, $(CH_2)_nOH$, $^{11}CH_3$, $(CH_2)_nF$ or $(CH_2)_n^{18}F$, and

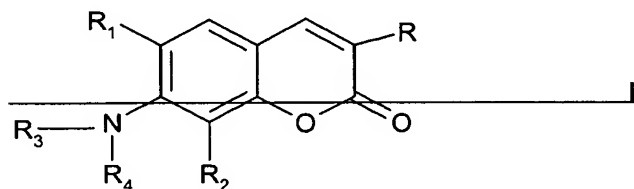
R is a group of formula



wherein X is O, S or NR_8 , R_8 being H, CH_3 , $^{11}CH_3$, $(CH_2)_nI$, $(CH_2)_n^{123}I$, $(CH_2)_nOH$, $(CH_2)_nF$ or $(CH_2)_n^{18}F$ (n being as defined above), Y is CH or N and R_6 and R_7 , independently, are H, NO_2 , F, ^{18}F , $O(CH_2)_nF$, $O(CH_2)_n^{18}F$, Cl, CN, ^{11}CN , OCH_3 , $O^{11}CH_3$, I , ^{123}I , $O(CH_2)_nI$ or $O(CH_2)_n^{123}I$ (n being as defined above),

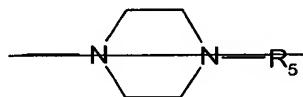
in free base or acid addition salt form.

6. (Currently amended) A method for labeling histopathological structures in vitro or in vivo, comprising contacting brain tissue with a compound as defined in claim 3 of the formula I, in free base form or in acid addition salt form.



wherein

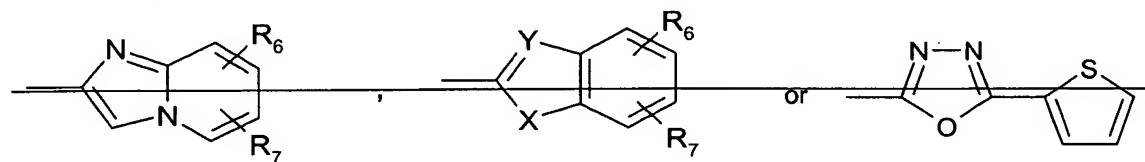
either R_1 and R_2 are both hydrogen and either R_3 and R_4 , independently, are H, CH_3 , $^{11}CH_3$, $(CH_2)_nI$, $(CH_2)_n^{123}I$, $(CH_2)_nOH$, $(CH_2)_nF$ or $(CH_2)_n^{18}F$, n being 2, 3 or 4, or R_3 and R_4 , together with the nitrogen atom to which they are attached, form a group of formula



wherein R_5 is H, $(CH_2)_nI$, $(CH_2)_n^{123}I$, $(CH_2)_nOH$, CH_3 , $^{11}CH_3$, $(CH_2)_nF$ or $(CH_2)_n^{18}F$, n being as defined above,

or one of R_1 and R_2 is hydrogen and the other, together with R_3 , forms a $(CH_2)_m$ -bridge, m being 2 or 3, and R_4 is H, CH_3 , $(CH_2)_nI$, $(CH_2)_n^{123}I$, $(CH_2)_nOH$, $^{11}CH_3$, $(CH_2)_nF$ or $(CH_2)_n^{18}F$, and

R is a group of formula



wherein X is O, S or NR_8 , R_8 being H, CH_3 , $^{11}CH_3$, $(CH_2)_nI$, $(CH_2)_n^{123}I$, $(CH_2)_nOH$, $(CH_2)_nF$ or $(CH_2)_n^{18}F$ (n being as defined above), Y is CH or N and R_6 and R_7 , independently, are H, NO_2 , F, ^{18}F , $O(CH_2)_nF$, $O(CH_2)_n^{18}F$, Cl, CN, ^{11}CN , OCH_3 , $O^{11}CH_3$, I , ^{123}I , $O(CH_2)_nI$ or $O(CH_2)_n^{123}I$ (n being as defined above);

~~in free base or acid addition salt form.~~

7. (Withdrawn) A method according to claim 6, for labeling β -amyloid plaques and neurofibrillary tangles.
8. (Withdrawn) A method according to claim 6, comprising the further step of administering the compound of formula I to a patient.
9. (Withdrawn) A method according to claim 6, comprising the further step of determining whether the compound of formula I labeled the target structure.
10. (Withdrawn) A method according to claim 9, comprising the further step of observing the target structure labeled with a non-radioactive compound of formula I, using fluorescence microscopy.
11. (Withdrawn) A method according to claim 9, comprising the further step of observing the target structure labeled with a radioactive compound of formula I, using positron emission tomography (PET).
12. (Withdrawn) A method according to claim 9, comprising the further step of observing the target structure labeled with a radioactive compound of formula I, using single photon emission computed tomography (SPECT).
13. (Withdrawn) A method according to claim 6 for diagnosing Alzheimer's disease.
14. (Withdrawn) A method according to claim 13, for monitoring the effectiveness of a therapeutic treatment of Alzheimer's disease.
15. (Withdrawn) A method according to claim 6 for detecting histopathological hallmarks of Alzheimer's disease.
16. (Withdrawn) A method according to claim 7, comprising the further step of administering the compound of formula I to a patient.

17. (Withdrawn) A method according to claim 7, comprising the further step of determining whether the compound of formula I labeled the target structure.
18. (Withdrawn) A method according to claim 17 for diagnosing Alzheimer's disease.
19. (Withdrawn) A method according to claim 18, for monitoring the effectiveness of a therapeutic treatment of Alzheimer's disease.
20. (Withdrawn) A method according to claim 17, comprising the further step of observing the target structure labeled with a non-radioactive compound of formula I, using fluorescence microscopy.
21. (Withdrawn) A method according to claim 7 for detecting histopathological hallmarks of Alzheimer's disease.
22. (Withdrawn) A method according to claim 17, comprising the further step of observing the target structure labeled with a radioactive compound of formula I, using positron emission tomography (PET).
23. (Withdrawn) A method according to claim 22 for diagnosing Alzheimer's disease.
24. (Withdrawn) A method according to claim 23, for monitoring the effectiveness of a therapeutic treatment of Alzheimer's disease.
25. (Withdrawn) A method according to claim 17, comprising the further step of observing the target structure labeled with a radioactive compound of formula I, using single photon emission computed tomography (SPECT).
26. (Withdrawn) A method according to claim 25 for diagnosing Alzheimer's disease.
27. (Withdrawn) A method according to claim 26 for monitoring the effectiveness of a therapeutic treatment of Alzheimer's disease.

28. (Canceled)
29. (Withdrawn) A method according to claim 7 for diagnosing Alzheimer's disease.
30. (Withdrawn) A method according to claim 29 for monitoring the effectiveness of a therapeutic treatment of Alzheimer's disease.
31. (Canceled)